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# EDUCATIONAL GROWTH IN THE 4-H DAIRY PROJECT MASSACHUSETTS, 1939-40\*

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\*Third in the Series of Evaluation Studies in  
4-H Club Work

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EDUCATIONAL GROWTH IN THE 4-H DAIRY PROJECT  
MASSACHUSETTS, 1939-40

SUMMARY OF THE STUDY

Purpose

The purpose of the study was to determine the degree to which three 4-H educational objectives were being reached by the boys and girls who participated in the 4-H dairy projects and to compare their growth with boys and girls who did not and never had participated.

Method

The study was conducted in the 9 counties of Berkshire, Essex, Franklin, Hampden, Hampshire, Middlesex, Norfolk, Plymouth, and Worcester in 1939-40, involving 85 members of the 4-H dairy project and 164 nonmembers. The 4-H Club work was carried on in the usual manner with an average of about one meeting a month and four or five county-wide meetings.

Tests were constructed for each of the three objectives in cooperation with interested individuals, and were given to both members and nonmembers at the beginning of the project period in November 1939 and again in October 1940 at the end of the period.

Findings

4-H MEMBERS LEARNED  
INFORMATION ABOUT  
DAIRYING

The 4-H dairy members acquired much more dairy information than an equivalent group of nonmembers, even though the 4-H members knew more about dairying at the beginning of the study than the nonmembers. The members learned more about selecting the dairy calf, feeding, showing, judging, dairy breeds, parts of a dairy cow, and milk than the nonmembers learned.

MEMBERS MAINTAINED  
DESIRE TO CONTINUE  
IN SCHOOL

Since younger boys and girls had a greater desire to continue in school than older boys and girls, a decrease in desire to continue in

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school was expected during the project year. The members, however, decreased but little while the nonmembers decreased more. A maintaining influence in contrast to an improving influence appeared to be manifest in this objective.

DEFINITENESS OF VOCATIONAL PLANS                      Although the members became somewhat more definite in regard to their vocational plans than the nonmembers, the reliability of the difference was not large enough in this study to attribute it to 4-H influence.

SOURCES OF HELP IN 4-H DAIRY PROJECTS                      Exhibits of dairy animals, 4-H dairy project meetings, and the project leader were the three highest ranking sources of help in the opinions of the members.

RECORD KEEPING                      The members liked to keep records and actually kept records. Record keeping rated fourth as a helpful source of learning. Several individuals indicated that they "found out it would be best for me to sell one of my milking animals."

VALUE OF 4-H DAIRY LITERATURE                      Members had one or more copies of the three dairy leaflets which were quite widely read and, according to their judgment, were not difficult to read. The leaflets rated fairly high in their opinion as a source of information in their dairy project.

MILK SUPERSTITIONS                      Many unfounded beliefs about milk have arisen in the course of time. These beliefs were still prevalent among both members and nonmembers, but not to so great an extent as one might expect. To enrich the program and might help an interesting leaflet on milk superstitions giving evidence and reasons why the beliefs are not true could be prepared for members' information.

#### THE 4-H DAIRY PROJECT IN MASSACHUSETTS

Massachusetts is an important milk-producing State. It ranked sixth in the number of milk cows in the North Atlantic States in the 1939 report of the United States Agricultural Marketing Service. There were about 137,000 milking cows in the State, owned in approximately 24,000 herds, producing 804,000,000 pounds of milk. The 4-H program affords an opportunity to boys and girls to learn dairying by participating in dairy projects.

##### Enrollment

In the dairy project in 1939-40, 385 boys and girls were enrolled in 11 counties in the State. Of this number, 368 were enrolled in the 9 counties of Berkshire, Essex, Franklin, Hampden, Hampshire, Middlesex,



Norfolk, Plymouth, and Worcester, included in the study. Twenty-three percent of the dairy members in these counties were involved in the study.

### Learning Experiences

The dairy project is a full-year project. The members enrolled in the fall of 1939 and completed their project the following fall. They engaged in a variety of informal learning experiences during this period. They had a dairy calf or dairy cow of their own, for which they had responsibility. They kept a record of their project.

Most counties used similar methods of conducting the project, although there were variations. The members were enrolled in dairy clubs usually, but some members were enrolled in agricultural clubs, and some were individually enrolled when the members lived far apart.

Meetings usually were held once a month under the supervision of a local leader, at which dairy instruction was given and subject matter discussed. In some counties, four or five county-wide dairy meetings were held, primarily to build enthusiasm for the project in connection with county and State activities and to hear speakers on general topics.

The literature for the members was furnished largely from the State office in the form of bulletins and leaflets. Members were given one or more of the following bulletins: Handbook for 4-H Calf Club Members; Handbook for 4-H Dairy Cow Club Members; and Raising the Dairy Calf. Articles from breed magazines were also a source of information. Sets of questions, each relating to a specific dairy topic, were discussed at meetings.

The fall exhibits constituted a popular phase of the program. Nearly every county had a county fair at which the members had an opportunity to show their animals and ability at fitting and showing them. Judging dairy animals is a part of the fair program.

The county club agents visited the homes of the members, inspected their projects, counseled with the boys and girls and their parents, and gave advice and suggestions for improvement of the members' methods. Farm and home visits personalize the information and help which the county club agent is in a position to give.

Much of the success of the dairy project was due to the work of the men and women who were local leaders. They organized the clubs, arranged for the meetings, planned the programs, visited and advised the members. In most instances, the leaders had sufficient knowledge of dairying to make unnecessary special training to teach them the required subject matter. Leader-training meetings were held to give help in methods, program planning, and teaching devices.

### Educational Objectives

The learning opportunities provided at 4-H Club meetings and events, the experience in feeding and caring for a dairy animal, and the informal exchange of ideas and attitudes occurring when groups met together were intended to bring about desirable educational changes on the part of the members participating. The variety of influences, direct and indirect which the 4-H Club program encouraged, may bring about growth in many educational directions. These are the educational objectives or outcomes of the program.

Instruction in dairy subject matter, experience in carrying on a dairy project, and attending exhibits of dairy animals should result in an increased knowledge about dairy information. Encouragement received in 4-H Club work, visits to educational institutions, and associations with other members may create or maintain their desire to continue their formal education, and may help to make their vocational goal more definite and positive. Informal conversations with members and former members show that they attribute these outcomes to their experiences in 4-H Clubs. The value of the latter objective is not so much that young people develop a permanent interest in a specific vocation, but that they feel that they know somewhat definitely what they want to do for a living when they grow older - that they have a goal in mind to work toward. The specific vocation they hope for may shift in their minds from time to time, but an enduring motivating value is wholesome from a developmental point of view.

These, then, are the educational objectives measured in this study: (1) Knowledge of dairy information, including the care and feeding of dairy animals; selecting a dairy calf; dairy breeds, and parts of a dairy cow. (2) Desire to continue their formal education longer. (3) More definite vocational goals.

### CONDUCTING THE STUDY

#### Preparing the Questions

Test questions were prepared to indicate achievement in the objectives.

Dairy information was divided into 10 types: (1) Selecting the dairy calf; (2) feeding; (3) sanitation; (4) diseases; (5) showing; (6) judging; (7) record keeping; (8) milk; (9) dairy breeds; and (10) parts of a dairy cow. Instruction was given in these types of dairy information.

In cooperation with State 4-H Club agents, subject-matter specialists, and members of the Federal extension staff, test questions were prepared for each of these types of dairy information.



Questions were also prepared in answer to which the boys and girls could describe their attitudes and, by answering the questions both at the beginning and end of the project, could reveal their change in desire to continue in their formal education and the definiteness of their vocational plans.

### Collecting the Data

The questions were given to members and nonmembers of the 4-H dairy project in Berkshire, Essex, Franklin, Hampden, Hampshire, Middlesex, Norfolk, Plymouth, and Worcester counties, both at the beginning of the project period in the fall of 1939 and again at the end of the project period in the fall of 1940. In this way, a record of growth in the objectives during the project period was obtained for both members and nonmembers, and a comparison of the two groups on each objective was possible. Before-and-after data were collected concerning 85 members and 164 nonmembers at 4-H Club meetings, through home visits, and during school time through arrangements made with the school authorities. When the questions were asked at the beginning of the study, neither the member nor the nonmember group was informed that the questions would be asked a second time at the close of the study.

## THE RESULTS OF THE STUDY

### General Information and Experiences in Dairying

In selecting the two groups, a conscious effort was made to obtain nonmembers of the same age and grade in school as the members. These were practical criteria to use in collecting the data. More accurate controls were applied in treating the data. The two groups about which beginning-and-end data were collected were not widely different in age, school grade, or school progress. The average age of the members was 13.9 years; that of the nonmembers, 13.5 years as of their last birthday. The average grade in school for the members was 8.4; for the nonmembers, 7.6. The members were 0.04 years accelerated in school, and the nonmembers were 0.22 years retarded. These differences were not significant, as was found in the analysis of data in selecting controls to make the two groups equivalent.

The members had participated in 4-H dairy projects for an average of 3.0 years, including the year in which the study was made. The nonmembers, of course, had never participated in 4-H dairy projects. All the members, of course, were in some 4-H Club work during the year of the study. They had participated an average of 3.8 years. During the period of the study, 47 percent of the nonmember group were in some 4-H project but not in a dairy project, and had participated for an average of 2.2 years. (Table 1.)

Table 1. - General information concerning members and nonmembers

General information	Members	Nonmembers
(1)	(2)	(3)
Number of individuals.....	85	164
Average age (years).....	13.9	13.5
Average grade in school.....	8.4	7.6
Average number of years accelerated or retarded in school.....	.04	-.22
Average number of years in a 4-H dairy project.....	3.0	0.0
Average number of years in some 4-H Club.....	3.8	2.2
Percentage in some 4-H Club in 1939-40.....	100.0	47.0

Both the member and nonmember groups had experiences with dairy animals. The group of nonmembers was not a group of boys and girls who had no experiences in dairying during the period of the study. They had dairy animals of their own and also helped take care of their parents' dairy animals. Many of the group could milk a cow. The experiences of the members and nonmembers with dairy animals are shown in table 2.

Table 2. - Members' and nonmembers' experiences with dairy animals

Experiences	Percentage	
	Members	Nonmembers
(1)	(2)	(3)
Had one or more dairy animals.....	97.6	11.6
Average number of dairy animals.....	3.0	0.3
Parents had one or more dairy animals...	87.1	31.1
Average number of dairy animals parents had.....	19.6	2.8
Helped take care of their parents' dairy animals.....	77.6	31.1
Helped take care of dairy animals for someone else.....	32.9	22.0
Helped either parents or someone else take care of their dairy animals.....	83.5	44.5
Could milk a cow.....	89.4	68.3
Milk for home use only.....	15.3	17.1
Milk sold to others.....	71.8	12.8



Nearly all the members and only 11.6 percent of the nonmembers had one or more dairy animals of their own. On the average, the whole group of members had 3.0 dairy animals, and the whole group of nonmembers had 0.3 dairy animals. Most members (89.4 percent) and 68.3 percent of the nonmembers could milk a cow.

Nearly one-third (31.1 percent) of the nonmembers' parents had one or more dairy animals, whereas 87.1 percent of the members' parents had dairy animals. The whole group of members' parents had 19.6 dairy animals on the average and the nonmembers' parents, 2.8 dairy animals.

Both groups had some experience in taking care of dairy animals for others besides themselves. Over three-fourths (77.6 percent) of the members and 31.1 percent of the nonmembers helped to take care of their parents' dairy animals. Nearly one-third (32.9 percent) of the members and 22.0 percent of the nonmembers helped take care of dairy animals for someone else. Over four-fifths (83.5 percent) of the members and 44.5 percent of the nonmembers helped their parents or someone else take care of their dairy animals.

In both groups, dairying was used as a source of money income for the families. However, the proportion of families was larger in the member group (71.8 percent) than in the nonmember group (12.8 percent). The groups were about equal in the percentage of families having a "family cow." In the member group, 15.3 percent of the families and, in the nonmember group, 17.1 percent of the families had the milk for home use only.

These data indicate that a large proportion of nonmembers were living in an environment in which dairying was a part and that they had direct experiences with dairy animals. However, the proportion of members was larger.

The members possessed much more dairy information at the beginning of the study and gained more than the nonmembers. At the beginning, the average score of the members was 101.6 of a total possible score of 188 points. The average score of the nonmembers was 55.9 points. The members gained 14.7 points, and the nonmembers 2.7 points.

The desire of the members to continue in school was greater than the desire of the nonmembers as shown by the index of 2.91 for the members and 2.38 for the nonmembers. The members lost slightly (0.03 points) and the nonmembers gained (0.09 points). These differences cannot be compared directly, as will be shown later, because the two groups are not equivalent on their beginning index, and their beginning index is related to their gains. The same consideration holds for the third objective, definiteness of vocational plans.

The definiteness of the members' vocational plans was greater than that of the nonmembers, as shown by the members' index of 2.40 and the nonmembers' index of 2.19. During the period of the study, the

members increased 0.13 points and the nonmembers 0.16 points. These are average indexes. They are the net result of some individuals gaining and some losing, as shown in table 3.

Table 3. - Average beginning score and gains of the two groups (unequated) in the three principal objectives

Objectives (1)	Average beginning score		Average gain	
	Members (2)	Nonmembers (3)	Members (4)	Nonmembers (5)
Dairy information.....	101.6	55.9	14.7	2.7
Desire to continue in school	2.91	2.38	-.03	.09
Definiteness of vocational plans.....	2.40	2.19	.13	.16

#### Growth in Dairy Information

The members made an average gain of 14.7 points in dairy information, and the nonmembers, 2.7 points. The difference of 12.0 points was in favor of the members but was between unequated groups of members and nonmembers. Hypothetically this difference might vanish or might increase if the two groups were equated. Hence, it was necessary to determine a correction factor which could be added or subtracted from the actual difference in gain between two equivalent groups.

In determining the correction factor, all data available in the study were tested to discover which would be needed. The only significant data were the scores at the beginning of the project - the measurement made when the members enrolled.

The analysis showed that the less the members knew about dairying at the beginning of the project, the more they gained during the project. An inspection of table 4 reveals that the members whose beginning score was 75 or below gained 18.6 points; the members whose beginning score was 76 to 124 gained 14.9 points; and the members whose beginning score was 125 or above gained 11.0 points.

Table 4. - Relationship between average beginning score and average gain in each score grouping of dairy information

Beginning score grouping (1)	Number of members (2)	Average beginning score (3)	Average gain during project (4)
125 and above.....	26	144.2	11.0
76 to 124.....	33	97.9	14.9
75 and below.....	23	58.8	18.6



Since the point at which they began made a difference in the amount gained, and since the members' beginning score was 101.6 points and the nonmembers' only 55.9 points, then in order to compare the two groups on the same basis of equal beginning scores, it was necessary to correct the raw difference of 12.0 points between the gains of the two groups. The correction factor computed was 12.2 points.

The correction factor of 12.2 points added  $\frac{1}{2}$  to the raw difference of 12.0 points between the gains of the two unequated groups gave the computed difference of 24.2 points in favor of the members. This difference was between the two equivalent groups of members and nonmembers having the same beginning score (fig. 1).



Unequivalent groups	12.0	
Difference between the <u>raw</u> gains of the <u>unequivalent</u> member and nonmember groups.		
Equivalent groups	24.2	
Difference between the <u>computed</u> gains of the <u>equivalent</u> member and nonmember groups.		

Figure 1. - Growth in dairy information by 4-H members

The standard error of the computed difference was 1.57 points; and hence, the critical ratio was 15.4, showing that the difference was highly significant statistically. <sup>2</sup>

<sup>1</sup>/ In this case the correction factor was added, making the computed difference between two equivalent groups greater. In other cases where the same relationship holds between beginning score and gain, but where the nonmembers have a higher beginning score than the members, the correction factor would be subtracted and difference in gains decreased.

<sup>2</sup>/ Critical ratios given below show the chances that the difference was too great to be attributed to random fluctuations in sampling:

Critical ratio	Chances in 100
2.00	97.7
2.50	99.4
3.00	99.9

### Change in School Plans

The members' desire to continue in school dropped slightly during the period of the project, but the nonmembers dropped still more.<sup>3/</sup> The two groups were made equivalent on their initial index of desire to continue in school. At the beginning of the project in the fall of 1939, the desire of the member group and the equivalent nonmember group to continue in school is indicated by 2.91 points. An index of 3.00 represents a desire to go 2 years to college. By the end of the project in the fall of 1940, the members' index had dropped 0.03 points to 2.88 and the nonmembers' index had dropped 0.18 points to 2.73. A decrease in desire to continue in school was expected during the period of the study because the data showed that older boys and girls had less desire to go to school than younger boys and girls. Hence, as the boys and girls in the study became older they would be expected to lose some desire to go to school (fig. 2).

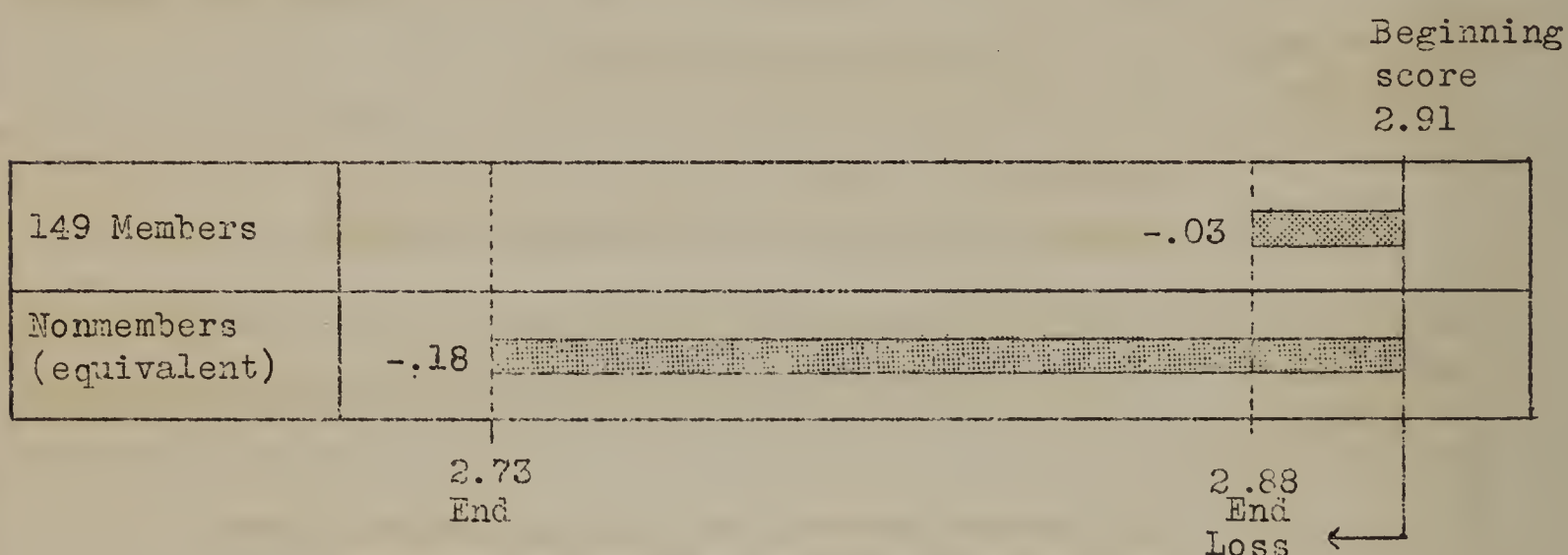


Figure 2. - Change in desire to continue in school

As indicated in table 5, the difference in decrease was 0.15 points in favor of the members. The standard error of this difference was 0.08 points; hence, the critical ratio was 1.9, showing that the difference was hardly large enough to be statistically significant.

Table 5. - Comparison of members and equivalent nonmembers in change in desire to continue in school

Groups	Number	Average score		Average change during project
		Beginning of:	End of:	
		project	project	
(1)	(2)	(3)	(4)	(5)
Members.....	149	2.91	2.88	-0.03
Nonmembers.....	149	2.91	2.73	-.18
Difference in gains of the two groups.....				.15
Standard error of the difference.....				.08
Critical ratio - statistical significance of the difference..				1.9

<sup>3/</sup> The "members" were members of any 4-H Club during the period of the study and the "nonmembers" were not members of any 4-H Club, since this objective is not unique to the dairy project.



### Change in Vocational Plans

At the end of the period of the study in the fall of 1940, both groups knew more definitely what they wanted to do for a living when they grew older than they did the previous fall. The two groups were made equivalent on their initial index of definiteness of vocational plans. The initial index was 2.40 points. By the fall of 1940, the member group<sup>4</sup> had increased 0.13 points to 2.53. The equivalent nonmember group had increased 0.08 points to 2.48 (fig. 3).

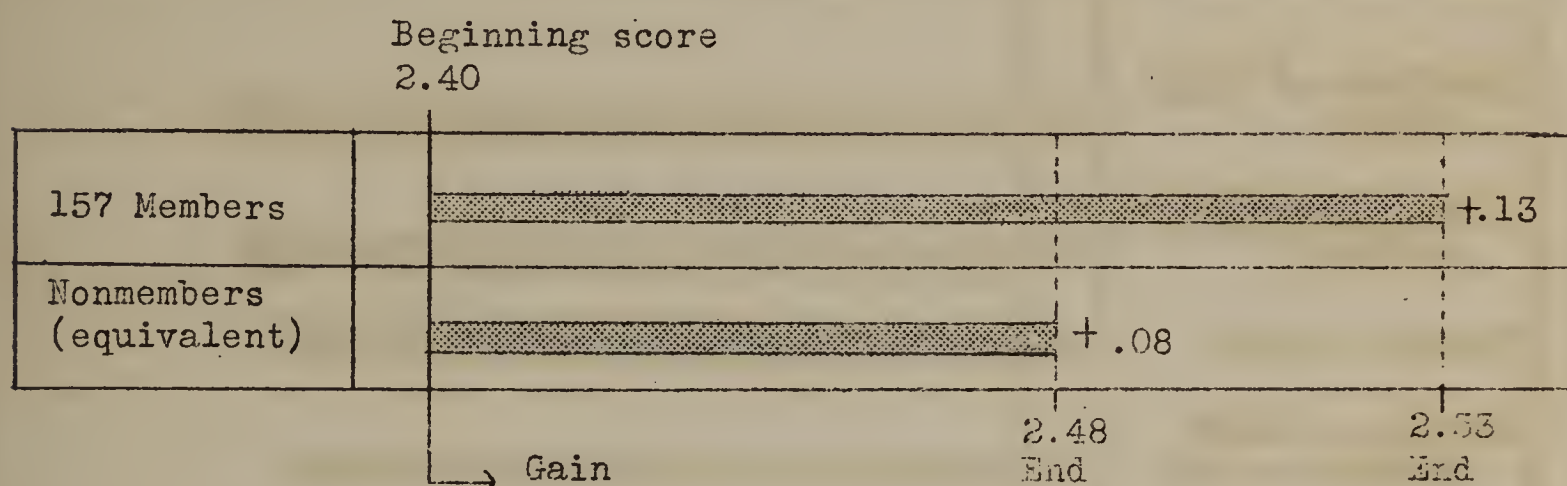


Figure 3. - Change in definiteness of vocational plans

The difference in change was 0.05 points in favor of the members. The standard error of this difference was 0.11 points. The critical ratio was only 0.5, showing that the difference was not significant statistically. The data show that the difference cannot reasonably be attributed to 4-H Club influence, because the amount of the difference could easily be obtained by chance in sampling.<sup>5</sup>

Table 6. - Comparison of members and equivalent nonmembers in change in definiteness of vocational plans

Groups	Number	Average score		Average gain during project
		Beginning of project	End of project	
		(3)	(4)	(5)
(1)	(2)	(3)	(4)	(5)
Members.....	157	2.40	2.53	0.13
Nonmembers.....	157	2.40	2.48	.08
Difference in gains of the two groups.....				.05
Standard error of the difference.....				.11
Critical ratio - statistical significance of the difference.....				.5

<sup>4</sup>/ See footnote 3, page 10.

<sup>5</sup>/ A low critical ratio indicates a greater probability that the difference resulted from chance fluctuations in sampling.

Side Lights of the Study

Members' opinions of sources of help in their dairy work. 4-H Club boys and girls received help in their projects from a variety of sources. Some of those sources of help are listed in figure 4. Each member of the dairy project judged each source listed and indicated the amount learned about dairy work from each source during the year's work.<sup>6/</sup>

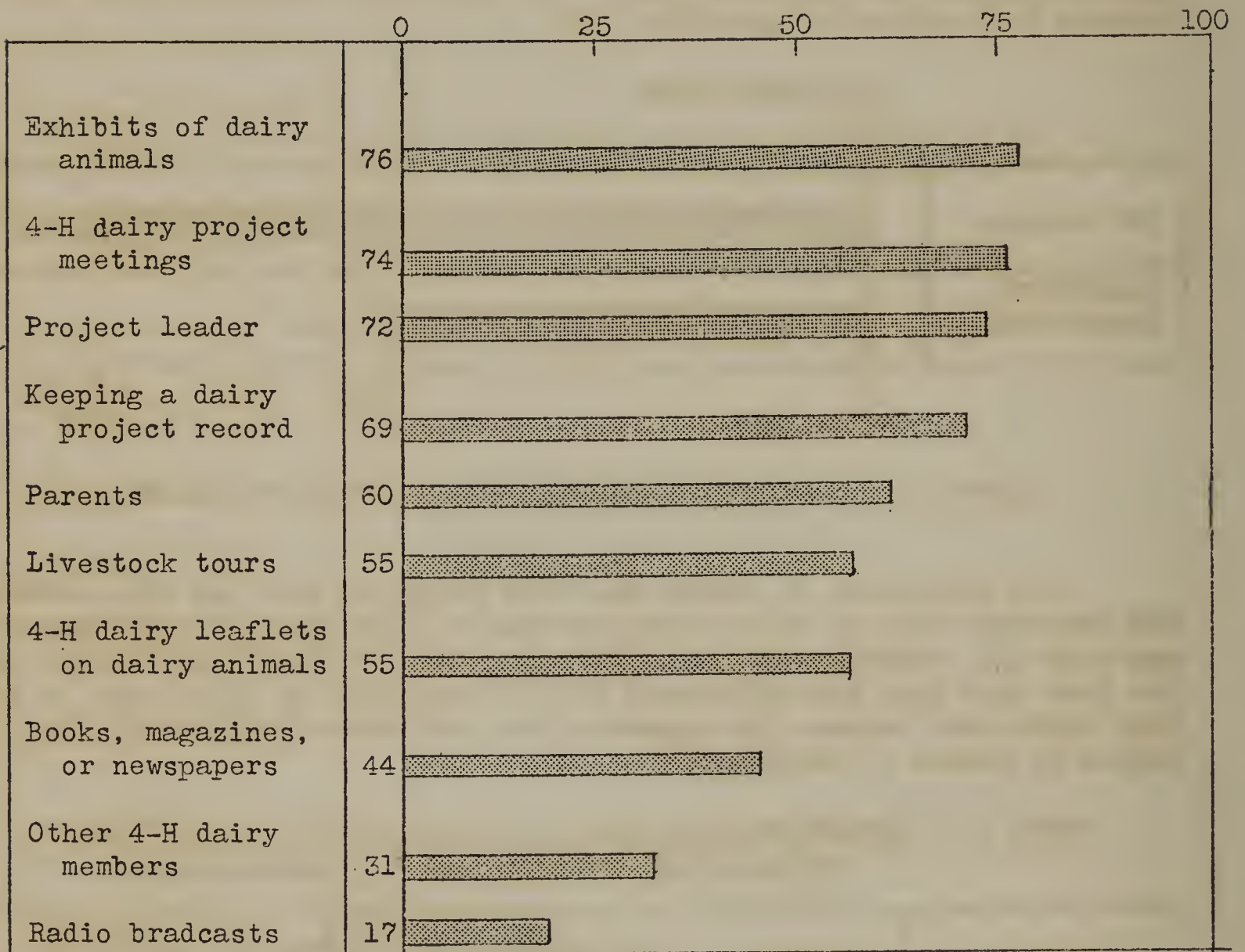


Figure 4. - Sources of help to boys and girls in 4-H dairy projects and percentage reporting "Much" or "Very much" learned from each source.

The results showed the members' opinions of the value of each source to them.

Exhibits of dairy animals stood very high. About three-fourths (76 percent) of the members said they learned much or very much about dairying from exhibits. 4-H dairy project meetings and the project leader rated very high in their estimation. Nearly one-third (31 percent)

<sup>6/</sup> For the procedure used, see the Appendix, question No. 9.



of the members judged their fellow 4-H dairy members high as a source of help. They learned much from each other. Radio broadcasts were lowest on the list, probably because the members had not heard broadcasts on dairying. Even so, one-sixth (17 percent) of the members said that they learned much or very much from this source.

4-H dairy members like to keep records of their dairy projects - or do they? It is a common notion that people do not like to keep records. The dairy project seems to be different. Nearly two-thirds (63 percent) of the members said they like to keep records. Their word was substantiated by the fact that 78 percent said they kept a complete record, and an additional 17 percent kept a partial record. At least two-thirds of those who kept only a partial record had legitimate reasons for not having had the record complete at the time they were interviewed. Five percent kept no record, and the reasons given were vague. (Table 7)

At least two-thirds (69 percent) of the members rated record keeping high as to amount learned from that activity. Most of the values they claimed for record keeping related to costs and receipts.

Table 7. - Keeping records of 4-H dairy projects

	Percentage
Liked to keep the 4-H dairy project record -	
Very much.....	48
Much.....	15
Some.....	28
A little.....	9
No.....	0
Kept a complete record.....	78
Kept a partial record.....	17
Kept no record.....	5
Amount learned from keeping the record -	
Very much.....	36
Much.....	33
Some.....	26
Very little.....	1
None.....	4

The following quotations were taken from the tests answered by the members. "I learned how much my cow and calf ate and how much I made by

selling milk." "I gained knowledge of the cost of raising heifers to milking age." "I found out it would be best for me to sell one of my milking animals."

The value of 4-H Club literature. The three principal 4-H dairy leaflets provided to members are shown in table 8. Ninety-one percent of the members had a copy of the Handbook for 4-H Calf Club Members. Of those who had a copy of the leaflet, 36 percent read all of it during the past year; 29 percent read most of it; 13 percent, about half of it; 21 percent, a little of it; and 1 percent did not read it. When one considers that this was not the first year many of the members had the leaflet, these data indicate that the leaflet was fairly well read. Apparently it is used as a reference book when problems arise.

Table 8 - 4-H dairy leaflets read by the members

	: Handbook :	: Handbook :	: Raising
	: for 4-H :	: for 4-H dairy:	: the
	: calf club:	: cow club :	: dairy
	: members :	: members :	: calf
(1)	(2)	(3)	(4)
Percentage who had a copy of leaflet.....	91	58	64
Percentage who read leaflet <sup>/a</sup>			
All of it.....	36	27	46
Most of it.....	29	33	21
About half of it.....	13	8	9
A little of it.....	21	24	15
None of it.....	1	8	9
Percentage who reported degree of difficulty in reading leaflet <sup>/b</sup>			
Very difficult.....	1	0	0
Difficult.....	3	7	2
Easy.....	62	59	61
Very easy.....	34	34	37

<sup>/a</sup> Based on the total number who had a copy.

<sup>/b</sup> Based on the total number who read some of it.

Table 8 reveals the fact that the leaflets were not difficult to read, in the opinion of the members, four percent found the Handbook for 4-H Calf Club Members difficult or very difficult; 7 percent found the Handbook for 4-H Dairy Cow Club Members difficult; 2 percent found raising the Dairy Calf difficult.



In general, as shown in figure 4, page 14, the members considered the leaflets a helpful source in their dairy work. Over half (55 percent) said they learned much or very much from the leaflets during the year of the study.

4-H dairy members knew more about various types of dairy information and gained more than nonmembers. In each of the 10 types of dairy information the members knew more than the nonmembers. For example, at the beginning of the study, the members knew 62 percent of the information in the test relating to selection of the dairy calf, and the nonmembers knew only 36 percent. The members gained 7 percent; the nonmembers gained only 2 percent. The differences in gain between the members and nonmembers were large in all types of dairy information except those relating to diseases of dairy animals and keeping records (table 9).

Table 9 - Comparison of members and nonmembers in various types of dairy information

Types of dairy information:	: Percentage of total possible score					
	Beginning			Gain		
	: Members	: Nonmembers	:	: Members	: Nonmembers	:
(1)	(2)	(3)	:	(4)	(5)	:
Selecting the dairy calf...	62	36	:	7	2	:
Feeding.....	60	37	:	10	3	:
Diseases.....	48	24	:	7	6	:
Sanitation.....	64	53	:	7	3	:
Showing.....	78	47	:	9	1	:
Judging.....	51	39	:	13	-1	:
Keeping records.....	85	65	:	0	0	:
Dairy breeds.....	51	12	:	8	-1	:
Parts of a dairy cow.....	30	0	:	11	0	:
Milk.....	45	30	:	7	2	:
:	:	:	:	:	:	:

4-H dairy members were somewhat less superstitious about milk than nonmembers. Many unfounded beliefs <sup>17</sup> about milk have arisen in the course of time. The extent to which 4-H dairy members and nonmembers accepted eight of these beliefs is shown in table 10. Nearly one-half of the members and nonmembers believed that milk which is sipped slowly is more easily digested in the stomach. However, research has shown that the opposite is true. Milk which is drunk naturally and liberally forms smaller and more and more easily digested curds than milk sipped slowly.

About two-fifths of both groups still held to the belief that cherries, rhubarb, oranges, and other acid fruits should not be eaten with milk.

<sup>17</sup> Frandsen, J. H. Some Milk Superstitions. Journal of Home Economics. Vol. 29, pp. 242-3. April 1937.

The old idea that thunderstorms cause milk to sour was accepted by very few of the boys and girls. However, the idea was accepted by more of the nonmembers than by the members.

These data indicate that the dairy program can be enriched by brief and interesting mimeographed leaflets on beliefs about milk, giving the evidence and reasons why the beliefs are not true.

Table 10 - Milk beliefs of members and nonmembers

Milk beliefs	Percentage answering				
	Members		Nonmembers		
	:Beginning:	End	:Beginning:	End	
(1)	(2)	(3)	(4)	(5)	
Milk that is sipped slowly is more easily digested in the stomach.....	47	48	45	46	
Cherries, rhubarb, oranges, and other acid fruits should not be eaten with milk.....	44	41	49	42	
Drinking plenty of milk will make a person fat.....	32	28	43	35	
Fish or other sea food should not be eaten with milk.....	19	13	25	20	
Milk was not intended by Nature to be used as a food after one's teeth are in.....	13	13	13	13	
Thunderstorms cause milk to sour.....	9	11	17	17	
Milk and meat should not be eaten together.....	9	5	15	12	
Milk in a balanced diet causes constipation.....	8	12	22	16	
Average.....	23	21	29	25	

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## DAIRY CATTLE

Name \_\_\_\_\_; Date \_\_\_\_\_

( ) Boy; ( ) Girl. Age at next birthday \_\_\_\_\_ years

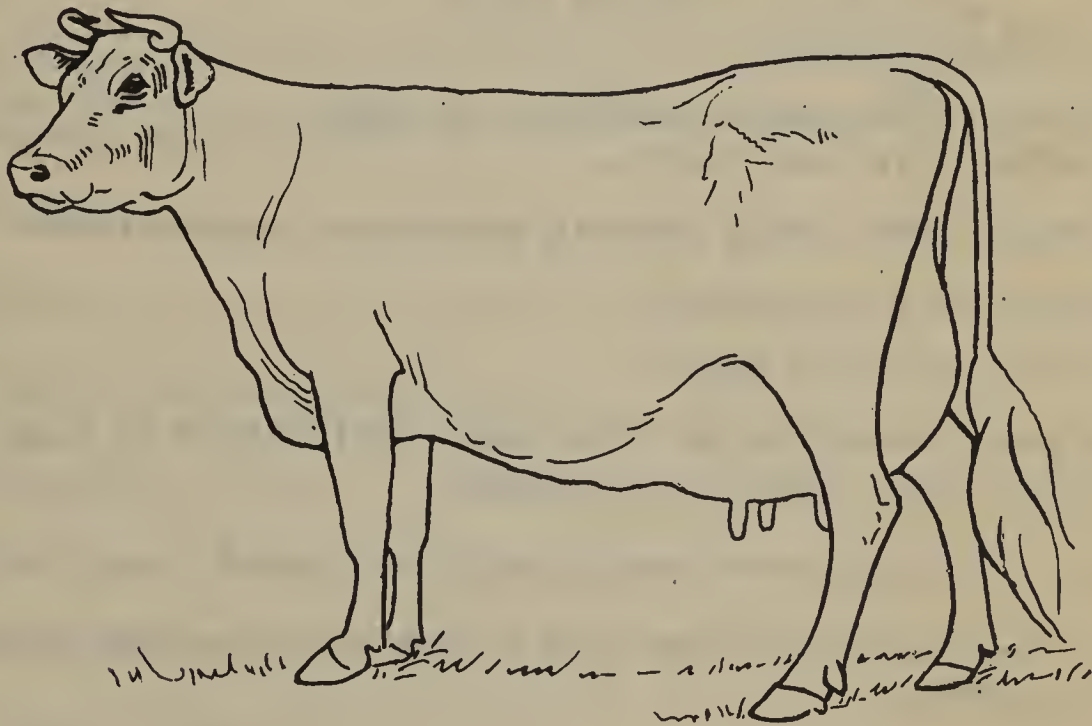
Name of your parent (or guardian) \_\_\_\_\_

Post office address \_\_\_\_\_

Town \_\_\_\_\_; County \_\_\_\_\_

School you attend \_\_\_\_\_; Grade you are in \_\_\_\_\_

Are you out of school? ( ) Yes; ( ) No.



Extension Service of the United States Department of Agriculture  
and the Massachusetts State College cooperating. 1939.

Part 1

1. Did you work with any dairy animals during this past year?
  - a. Did you have a dairy calf of your own?.....( )Yes; ( )No.
  - b. How many?\_\_\_\_\_ c. What breed?\_\_\_\_\_.
  - d. Were they grade, pure-bred, or both?\_\_\_\_\_.
  - e. Did you have a dairy cow of your own?.....( )Yes; ( )No.
  - f. How many?\_\_\_\_\_ g. What breed?\_\_\_\_\_.
  - h. Were they grade, pure-bred, or both?\_\_\_\_\_.
  - i. Did your parents have any dairy animals this past year? ( )Yes; ( )No.
  - j. How many?\_\_\_\_\_ k. What breed?\_\_\_\_\_.
  - l. Were they grade, pure-bred, or both?\_\_\_\_\_.
2.
  - a. Did you help take care of your parents' dairy animals this past year?.....( )Yes; ( )No.
  - b. Did you help take care of dairy animals for someone else this past year?.....( )Yes; ( )No.
  - c. Can you milk a cow?.....( )Yes; ( )No.
3.
  - a. Did you have vocational agriculture in high school during this past year?.....( )Yes; ( )No.
  - b. Did you study about dairy work in vocational agriculture-
    - (1) during this past year?.....( )Yes; ( )No.
    - (2) before this past year?.....( )Yes; ( )No.
  - c. How many years have you had vocational agriculture in high school (include this past year)?\_\_\_\_\_years.
4.
  - a. Were you in 4-H Club work during this past year?.....( )Yes; ( )No.
  - b. How many years have you been in 4-H Club work (include this past year)?\_\_\_\_\_years.
5.
  - a. Did you have a 4-H dairy project during this past year?...( )Yes; ( )No.
  - b. How many years have you had a 4-H dairy project (include this past year)?\_\_\_\_\_years.
6. Did you keep a complete record of your 4-H dairy project this year?
  - ( )a. Yes, a complete record.
  - ( )b. No, I started to but did not finish it.
  - ( )c. No, I kept no record at all.



7. a. If you did not keep a complete record, tell why\_\_\_\_\_

b. Did you like to keep a record of your dairy project?

( )No;        ( )A little;        ( )Some;        ( )Much;        ( )Very much.

c. What did you learn from keeping a record of your dairy project?

8. Did you have a copy of any of the following leaflets on dairy animals?  
Did you read any of them during the past year? How easy were they to  
understand? Place check marks in the proper spaces below:

	: Handbook :for 4-H Calf :Club Members :	: Handbook : for 4-H : Dairy Cow :Club Members	: Raising : the : Dairy : Calf	:
	(1)	(2)	(3)	(4)
a. Did you have a copy of it?	:	:	:	:
Yes.....	:	:	:	:
No.....	:	:	:	:
b. How much of it did you read?	:	:	:	:
Read all of it.....	:	:	:	:
Read most of it.....	:	:	:	:
Read about half of it.....	:	:	:	:
Read a little of it.....	:	:	:	:
Did not read it.....	:	:	:	:
c. How easy was it to understand?	:	:	:	:
Very difficult.....	:	:	:	:
Difficult.....	:	:	:	:
Easy.....	:	:	:	:
Very easy.....	:	:	:	:

9. How much did you learn about dairy work this past year from each of the following? Put one check in each row to show how much you learned.

	How much learned -				
	:None:	:Little:	:Some:	:Much:	:Very:Much:
a. From parents.....	:	:	:	:	:
b. From project leader.....	:	:	:	:	:
c. From other 4-H dairy members.....	:	:	:	:	:
d. From 4-H Club leaflets on dairy animals.....	:	:	:	:	:
e. From books, magazines, or newspapers.....	:	:	:	:	:
f. At 4-H dairy project meetings.....	:	:	:	:	:
g. From radio broadcasts.....	:	:	:	:	:
h. At exhibits of dairy animals.....	:	:	:	:	:
i. On livestock tours.....	:	:	:	:	:
j. From keeping a dairy project record.....	:	:	:	:	:
k. From agriculture work in school.....	:	:	:	:	:

## Part 2

10. The man from the county fair association visited a rural school. He gave a talk on boys' and girls' exhibits which he hoped to start at the fair in the fall. Arthur Jackson, who attended this school, became very interested. Upon arriving home from school that night, he told his parents all that he could remember about what the man said. After talking things over with his parents and the fair representative, he decided to raise a dairy calf to exhibit at the fair. He bought the calf and took care of it to the best of his ability. At the end of the year he wrote a story of how he selected and raised this calf.

Here is his story.

You are to read Arthur's story and then check the mistakes Arthur made. Check only his mistakes.

### Arthur's Story

"It was in June when I decided to raise a calf for the fair exhibit. Dad and I visited our nearest neighbor, who had a modern dairy farm and who had a Jersey dairy calf for sale, which was being fed on skim milk. We liked the calf so much that we immediately bought it without asking



any further questions. It was 2 weeks old and cost only \$5. I discovered later that it could not be registered. We took the calf home and I tied it in the field under the apple tree where it could get plenty of green grass and shade. I continued to give it warm skim milk three times a day, as our neighbor had been doing, and started feeding a handful of grain, which I put in a small box fastened to the tree. The calf grew well, and I taught it to lead. She would stand and pose for my friends. She became quite a pet.

"The day before the fair I brushed my calf well and fixed up her horns. Then I put a blanket on her which was made from an old rug so badly worn that it could not be used in the house. Just before I was to leave for the fair I received word that I could not show because my calf was not registered. I felt pretty badly about it, but since there was nothing I could do, I turned the calf out to pasture with the cows and left it until cold weather. This is all I have to tell of my year's work. I hope that next year I shall have better success."

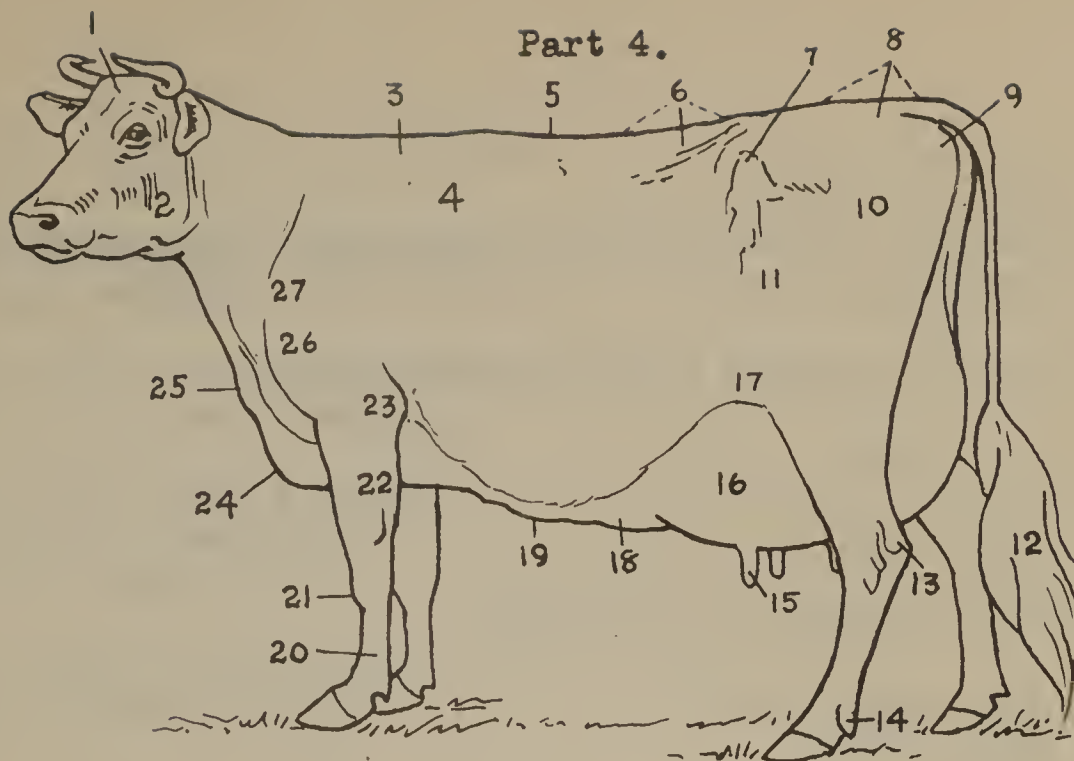
Check Arthur's mistakes - only his mistakes.

- ( )a. He bought the first calf which was shown them.
- ( )b. He did not buy a pure-bred calf.
- ( )c. He tied the calf in the field.
- ( )d. He fed the calf skim milk.
- ( )e. He began feeding grain to the calf too early.
- ( )f. He made a pet of the calf.
- ( )g. He began too late to fit the calf for the fair.
- ( )h. He began too late to cover the calf with a blanket.
- ( )i. He did not insist on showing his calf when he found out it was not registered.
- ( )j. He turned out the calf to pasture with the cows.
- ( )k. He did not buy the calf soon enough.

Part 3.

11. What important things should Arthur have taken into consideration in selecting a 2-week-old heifer calf? Check the EIGHT things in the list below which you think are the most important for him to take into consideration.

- ( )a. The body-type of the sire and dam.
- ( )b. The body-type of the calf.
- ( )c. The record of cow in the herd which led the county in milk production during the last month.
- ( )d. The modern, up-to-date barn in which the herd is kept.
- ( )e. The record of the dam.
- ( )f. The record of the sire's dam.
- ( )g. The body-type of the new herd sire purchased 3 months ago.
- ( )h. The modern sanitary equipment for bottling milk.
- ( )i. Whether the herd is free of TB.
- ( )j. Whether the herd is free of Bang's disease.
- ( )k. Whether the herd is free of ringworm.
- ( )l. Whether the herd is free of mastitis.
- ( )m. The color markings of the calf.
- ( )n. The price of the calf.
- ( )o. The pedigree of the calf.
- ( )p. The record of the cow that had the best milk-production record in the county last year.
- ( )q. The body-type of the cow that won first prize at last year's county fair.



12. Below are the names of some parts of a dairy cow. Place the number of each part on the blank line in front of the name of that part. Use the numbers on the above drawing of the dairy cow.

Some Parts of a Dairy Cow.

- |               |                  |                  |
|---------------|------------------|------------------|
| _____a. Udder | _____e. Withers  | _____h.Brisket   |
| _____b. Rump  | _____f. Pin bone | _____i.Flank     |
| _____c. Teat  | _____g. Hock     | _____j.Milk well |
| _____d. Loin. |                  |                  |

Part 5

13. The questions below can be answered by using the list of cattle breeds at the right. Place the proper numbers of the breeds on the blank lines following the questions.

- a. The principal dairy breeds in the U.S. are\_\_\_\_\_.
- b. The dairy breed with the largest animal is\_\_\_\_\_.
- c. The dairy breed best suited to rough and hilly pasture is\_\_\_\_\_.
- d. The dairy breeds that produce butter fat with the yellowest color are\_\_\_\_\_.
- e. The black and white dairy breed is\_\_\_\_\_.
- f. The dairy breed which has an average butterfat test of over 5% is\_\_\_\_\_.
- g. The dairy breeds which have an average butterfat test of about 4% are\_\_\_\_\_.
- h. The dairy breed which gives the most milk is\_\_\_\_\_.

List of Cattle Breeds

1. Aberdeen Angus.
2. American Shorthorn.
3. Ayrshire.
4. Brown Swiss.
5. Guernsey.
6. Hereford.
7. Holstein-Friesian.
8. Jersey.



## Part 6

Check each of the answers which are true. One or more than one answer in each group may be true as in the following example:

The milk for feeding a dairy calf should be -

- ( ) a. cold.
- (✓) b. warm.
- ( ) c. very rich in butterfat.
- ( ) d. sour.
- (✓) e. sweet.

14. A newborn calf usually should be left with its mother -

- ( ) a. not over 2 days after birth.
- ( ) b. for at least 1 month after birth.
- ( ) c. longer if it is weak than if it is strong.
- ( ) d. until it naturally learns to drink milk from a pail without being taught.
- ( ) e. for a long time, because it will be easier to teach it to drink.

15. Check the quickest way to teach a calf to drink:

- ( ) a. Hold its mouth in warm milk until it drinks.
- ( ) b. Feed the calf with a milk bottle and nipple.
- ( ) c. Let it suck your fingers as you lower its mouth into warm milk.

16. Scours is a common ailment of dairy calves. It may be caused by -

- ( ) a. overfeeding.
- ( ) b. dirty feeding pails.
- ( ) c. irregular feeding.
- ( ) d. dirty pens.
- ( ) e. too sudden change of food.
- ( ) f. cold milk.
- ( ) g. sour milk.

17. The growing heifer -

- ( ) a. requires more feed than a 2-month old calf.
- ( ) b. should be turned out to pasture all summer with the dry cows.
- ( ) c. requires little or no exercise during the winter months.
- ( ) d. should be shut up in a dark box stall during the winter months.
- ( ) e. should be kept in a warm place so as to put on plenty of fat.



18. Check the good feeding practices:

- ( )a. Keep the calf a little hungry after each feeding.
- ( )b. Feed the calf as much milk as it will take at each feeding.
- ( )c. More skim milk should be fed to make up for the cream removed by separation.
- ( )d. The calf should be fed milk and grain whenever it is hungry.
- ( )e. The calf should be fed at regular times during the day.

19. Check the good feeding practices:

- ( )a. Feeding hay to a dairy calf tends to develop too much barrel.
- ( )b. Silage may be fed in small amounts to calves over 3 months of age.
- ( )c. Grain should not be given to a calf until it is 1 year old.
- ( )d. Alfalfa and clover roughage helps to furnish bone building minerals.
- ( )e. Alfalfa and clover roughage helps to furnish muscle building protein.

20. Beet pulp is often fed dairy animals being prepared for the show ring -

- ( )a. because it is cheap.
- ( )b. because of a shortage of hay.
- ( )c. because it helps to develop a good barrel.
- ( )d. because it has a high protein content.

21. In order to show at most fairs a boy or girl must own -

- ( )a. a grade calf.
- ( )b. a purebred calf.
- ( )c. an unregistered calf.
- ( )d. a calf registered in the name of the boy or girl.
- ( )e. a calf registered in the name of the father and child.

22. A calf will show up better in the ring if it has been -

- ( )a. allowed to run at will.
- ( )b. trained to lead.
- ( )c. trained to stand still.
- ( )d. trained to prance about with head high when the judge is looking at it.

23. While showing the calf in the show ring the boy or girl should -

- ( )a. watch what the others are doing.
- ( )b. watch the judge.
- ( )c. watch the people in the ringside.
- ( )d. watch the boy at the head of the line.
- ( )e. watch his own calf.

24. Milk contains bacteria. To keep down the number of bacteria in milk -

- ( )a. the hands should be wet when milking.
- ( )b. the cow's flanks, udder, and teats should be washed before starting to milk.
- ( )c. the milk should be stored in a cool place.
- ( )d. the cows should be fed good food.

25. The FOUR most common dairy animal diseases in Massachusetts are -

- ( )a. Bang's disease.
- ( )b. Anthrax.
- ( )c. Foot-and-mouth disease.
- ( )d. Mastitis.
- ( )e. Scours.
- ( )f. Shipping fever.
- ( )g. TB.

26. Mastitis -

- ( )a. is a disease of the cow's udder.
- ( )b. is a disease of the cow's ears.
- ( )c. can be cured by giving the cow a dose of salts.
- ( )d. can be cured by an operation on the ear.
- ( )e. may be checked by a frequent downward massaging followed by complete milking out.
- ( )f. may start from germs that enter the udder by the teat canal.

27. In judging dairy cows some things are more important than others. In the list that follows check the FOUR most important items to consider.

- ( )a. Breed characteristics.
- ( )b. Head and neck.
- ( )c. Mammary development.
- ( )d. Switch.
- ( )e. Size of muzzle.
- ( )f. Body capacity.
- ( )g. Length of legs.
- ( )h. Dairy temperament.

28. A dairy farm -

- ( )a. is required to hold a certificate of registration before a dealer can legally sell milk in this State.
- ( )b. in this State is a place where 3 or more milking cows are kept, and a part or all of the milk is sold.
- ( )c. outside this State must comply with our regulations to sell milk in this State.
- ( )d. in this State does not have to be inspected unless 4 or more cows are kept on the farm.



29. Check those things that go to make up a sanitary dairy farm:

- ( )a. No other animals are kept in the stable with milking cows.
- ( )b. Ordinary water pails are used for milk pails.
- ( )c. An open well is used as a source of water supply.
- ( )d. Milk is stored in a place where there are no odors.
- ( )e. Milk pails are washed thoroughly and scalded after each milking.

30. Cow's milk normally contains -

- ( )a. albumen.
- ( )b. ash.
- ( )c. casein.
- ( )d. fat.
- ( )e. sugar
- ( )f. water.

31. What causes milk to become sour?

- ( )a. The temperament of the cow.
- ( )b. Thunderstorms.
- ( )c. The growth of bacteria.

32. Milk is used as -

- ( )a. a food.
- ( )b. to make paint.
- ( )c. to make glue.
- ( )d. to make buttons.
- ( )e. to make cloth.

33. Keeping records of income and cost of milk production -

- ( )a. is required of all dairy club members who have milking animals.
- ( )b. is fun to do.
- ( )c. is not worth the trouble and effort.
- ( )d. is valuable in finding out which cows are paying for themselves.
- ( )e. adds interest to the work.

34. Which of the following if any are true?

- ( )a. Thunderstorms cause milk to sour.
- ( )b. Milk that is sipped slowly is more easily digested in the stomach.
- ( )c. Fish or other sea food should not be eaten with milk.
- ( )d. Milk in a balanced diet is constipating.
- ( )e. Milk and meat should not be eaten together.
- ( )f. Drinking plenty of milk will make a person fat.
- ( )g. Milk was not intended by nature to be used as a food after one's teeth are in.
- ( )h. Cherries, rhubarb, oranges, and other acid fruits should not be eaten with milk.



Part 7

35. How long do you plan to go to school? (Check one).

- ☐ a. I want to go 2 years to high school.
- ☐ b. I want to finish high school.
- ☐ c. I want to take a 2-year college course.
- ☐ d. I want to take a 4-year college course.

36. What other education plans do you have? \_\_\_\_\_  
\_\_\_\_\_

Part 8

37. Do you have in mind what you plan to do for a living (your occupation) when you get older? (Check one)

- ☐ a. I don't know.
- ☐ b. I think I know but am not sure.
- ☐ c. I am almost sure.
- ☐ d. I am very sure.

38. If you know what you want to do for a living, write it on this line \_\_\_\_\_

39. Do your parents own any dairy animals? ☐ Yes; ☐ No.

40. What do your parents do with the milk from their cows?

- ☐ a. Use all of it at home.
- ☐ b. Use some of it at home.
- ☐ c. Sell some to a milk company.
- ☐ d. Sell it to customers on our own milk route.